

# THE PERFORMANCE OF INFORMATION SYSTEMS THROUGH ORGANIZATIONAL CULTURE

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## **Abstract**

In this paper we analyze the improvements in organizational behaviour needed to maximize the efficiency of information systems (IS). For this purpose, we have studied the mutual relationships among information technologies (IT), IS and organizational culture. Then, we focus on how the organizational culture influences this specific process distinguishing between informatic culture and informational culture, the latter being the one allowing an adequate implementation and development of the IS.

Finally, we underline the cultural consistency which the implementation of an IS requires. In order to do this, we must measure the degree of technical and financial feasibility of the IS regarding the quantitative and measurable effort an organization must make to implement it, together with the consistency of this system with the pre-existing culture. When considering the need for a cultural change, we argue that the best choice is a «bubble-like» cultural implementation.

**Keywords:** Informational culture. Informatic Culture. Information Systems. Information Technology. Organizational Change. Organizational Reinforcement.

## **Notional foundations**

This paper analyzes the Information System (IS) and the organizational culture as two closely related issues in any firm. More precisely, we shall see how these two phenomena interact in order to help achieve the purposes of an economic unit. However, before we may draw any conclusions about the matter, it is necessary to define the two concepts, albeit in a summarized way, so that the foundations of their mutual relationship can be properly established.

### *Information system and information technology*

Concerning the notion of IS, it must be said that its delimitation is a problematic one, due to the variety of existing definitions, due to the multiple names the concept is and has been given historically and, above all, due to the present confusion between this notion and that of Information Technology (IT). These confusions show the great complexity of an organizational factor with different aspects, including technical, human and organizational ones.

Most definitions of IS include the functions this system carries out as part of the notion itself. Thus, for Anderson, Raeburn and Beddie (1992), an IS is a system which collects, records, stores and rearranges the data on the operations of a business, and then offers the results of this

process to the suitable personnel of a corporation under the shape of information; this information will be used to facilitate an efficient management of the said business, to control its operations and as a basis for efficient action. In a nutshell, an IS must help corporations to make decisions.

In order to carry out these functions, the system must have a number of components; according to Davis (1995) and Gremillion and Pyburn (1988), such components are: hardware, software, data, people and procedures. A longer list is provided by Turban, McLean and Wetherbe (1996), who quote hardware, software, databases, people, procedures, purposes, networks and social context. It can be observed that, among these elements, informatic components are a must, which is a source of confusion (for IS is equated to informatics, and, eventually, to IT); therefore, we suggest as an alternative list: information and data, people and supporting elements.

By information and data we mean the output and the input of these systems. Concerning people, we shall analyze this factor later, as we deal with organizational culture. The supporting elements are the physical resources used to carry out all the functions of the information system. Such resources may be informatics-based (which is unavoidable nowadays), but the abstract notion of IS leads us to emphasize that computers are just another support element, for which there are other mechanical or manual alternatives (telephones, filing cabinets... even pen and paper).

So as to underline this idea, it must be remembered that the concept of IS or MIS (Management Information Systems) was born before computers were, although computers have lead to a widening of this concept (Shave and Bhasckar 1982). Besides, it would be a mistake to describe IS from a merely informatic point of view, for it would mean disregarding its organizational and human dimension. In short, an IS cannot be effectively used and understood if these latter factors are ignored (Laudon and Laudon 1991a).

On the other hand, it must also be acknowledged that the controversy about the notion of IS results from its different definitions. Until a few years ago, the most frequently used academic term was MIS (Management Information System). However, MIS can also be called Organizational Information Systems, Computer Based Information Systems or simply IS (Ives, Hamilton and Davis 1980). Of all these names, IS is the most general one, for it specifies neither which users it is addressed to (CEO's or not) nor which technology it requires (computers or otherwise) to transform data into information.

To make this terminology even more complex, IT is frequently used as a synonym of IS, as we mentioned above. This is due to the fact that, strictly speaking, IT concerns the technological component of an IS, as it includes hardware, databases, software networks and other resources suitable for information processing. As such, it may be seen as a subsystem of an IS (Turban,

McLean and Wetherbe 1996) or, even better, as one of its components, which we discussed above as a supporting element.

The term IT was first referred to by Leavitt and Whisler (1958), who used it to describe the various developments appeared in different fields (from sociology to electronic engineering) sharing a concern for the systematic manipulation of information by individuals, groups or machines. The notion also included all the technologies and applications combining data processing and the storing power of computers with the possibility of distance transmission of telecommunications (Child 1987). Any technology based on informatics and telecommunications hardware and/or software would be included within this definition (Cooper and Zmud 1990).

### *Organizational culture*

Going back to the idea that people are one of its most important components, the notion of organizational culture as a general term describing "how things are done in a corporation" is linked to that of IS, as it explains how people behave in the face of IS.

Thus, concerning the people who are part of an IS, the culture of an organization will influence and be influenced by both users (who generate the system input and/or use the output) and technicians (including the operators in charge of feeding data into the computer and/or monitor its correct operation; system analysts, who are responsible for the logical design of such systems, and the programmers, who create the computer software). If they are members of the corporation or are directly related to it, they are part of the organizational culture or according to El Sawy (1985) "cultural implicates". In this way, none of these must be excluded from an analysis of the organizational behaviour in the face of IT. Besides, Pliskin, Romm, Lee and Weber (1993) point out that the same IS may have different meanings for different people, such as system analysts and users, for their points of view concerning these systems may not be the same. This means that users should also take part in the implementation process of these systems, and therefore, according to Ward (1987) technicians should make an effort to manage information, which is what users are interested in, and not merely computers.

Unfortunately, in many cases IS is implemented following technicians' analyses and considerations, with little if any regard for end users. In addition to the operational problems this may cause, it is not surprising that a cultural clash should arise with users, if they have not been involved in such implementation. This problem is mentioned by Lin and Ashcraft (1990), who argue that end users are part of the organizational culture and, therefore, have a meaningful influence upon the success of a new IS.

Once we have clarified this issue, and focusing upon the notion of organizational culture, we believe that, instead of analyzing the various definitions of the paradigm, it may be more helpful to describe its most important characteristics. Thus, it would constitute a guideline to

know which activities are in agreement with a firm's personality (Alvesson 1989); its existence is linked to the notion of shared intentions (Hayes and Tomes 1988; Robbins 1987); it results from the empirical need to solve management problems (Camerer and Vepsäläinen 1988); and it is different for each firm (Adams and Ingersoll 1985; Pearce and Robinson 1988).

Considering the specific characteristics of the term, we propose a definition that includes all of them: a set of values, symbols and rituals shared by the members of a specific firm, which describes the way things are done in an organization in order to solve both internal management problems and those related to customers, suppliers and the environment.

Within this paradigm, when the culture is in agreement with the IT/IS, the consequences may be:

1. It allows us to know if the implementation of IT/IS will be satisfactorily accepted (an issue which shall be discussed later on).
2. It lays down the patterns for the usage of information (Itami 1987). Thus, it helps identify which information is important, where it may be obtained and, above all, to whom it must be supplied.
3. It is an important means of communication, both inside and outside the firm (Schein 1992) and it allows us to assess the effectiveness of IT applied to telecommunications (Grote and Baitsch 1991; Kanungo 1998).
4. It creates cohesion among the members of a firm, as it explains "the way things are done in a firm" (Chalofsky and Reinhart 1988; Lei, Slocum and Slater 1990).
5. It allows the creation of a social control within a firm. For instance, the implementation of an IS, and the correct predisposition of corporate members towards such IS, is hardly controlled merely by means of formal measures. Cultural rules are also very important in this respect (O'Reilly 1989).
6. It may help increase the satisfaction of all internal collaborators of the firm, for it facilitates environmental adaptation and internal integration, thus reducing the anxiety created by IS/IT (Berthon 1993).

Nevertheless, it must be emphasized that, for the said values to be operational, they must be shared by the vast majority of corporate members. At the same time, we must point out that the specific nature of a culture may adopt different shapes, for it is, after all, the personality of a firm; besides, within the same firm there may exist different subcultures. Since we are concerned about the correct usage of an IS, we shall now analyze the specific relationship between IT, IS and organizational culture.

### **Influence between IT, IS and organizational culture**

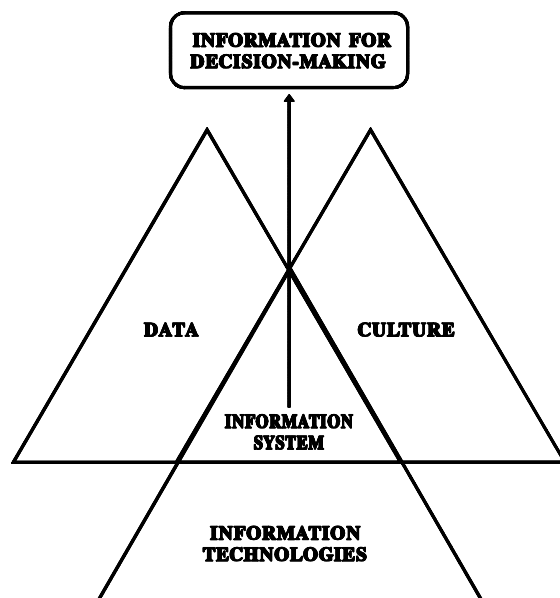
Considering the definitions studied in the previous section, we propose Figure 1 as an expression of the relationships between IT, IS and organizational culture.

Figure 1 is a good starting point to understand how information (whether suitable or not) is generated so that a firm may make decisions (both strategic and tactical ones).

Regarding the data, if we bear in mind that an IS is responsible for transforming them into information, it follows that the amount and quality of such data will be a key factor. From this point of view, Southern and Murray (1994) use the term "information-based culture" to express the need for all those involved in data collection to share the idea that an IS must be supported by a good data system (both in the shape of input and output of the IS). In addition to these we must say that, when these data are processed, ethical principles must be considered, which are in turn a result of the general culture existing in the firm.

Nevertheless, we should not ignore Proffitt's (1995) warning that organizations and IS

FIGURE 1. INFLUENCE AMONG IT, IS AND ORGANIZATIONAL CULTURE.



which are only supported by data, are static systems whose procedures are based on a control culture which, in itself, does not increase knowledge. Thus, we can see that more elements are required.

Concerning IT (informatics, office equipment and telecommunications), they are the physical support of an IS. Although we are focusing on the qualitative and human side of the process, we must also admit that a necessary -albeit not sufficient- prerequisite for a suitable implementation of an IS is the financial and technical feasibility of the acquisition or innovation

of this IT. However strong the organizational culture and its positive approach to the usage of an IS are, if the IT will not entail a satisfactory profit for the firm and/or it is not technically mastered, it is not likely to generate useful information. Nevertheless, the other prerequisite has been mentioned by DeLone and McLean (1992), who stress that the mere acquisition of IT is not enough to create a profit; it must also be suitably managed by its users.

The third component that directly conditions a successful implementation of an IS is the corporate culture. In our opinion IT, together with its usage within an IS, may become an important symbol within the culture and vice versa. In fact, due to the versatility of IS, its specific interpretation within the culture may not be as visible as it might be initially expected.

Bearing this in mind, we might wonder about the specific way the mutual relationship between culture and IT must be envisaged, i.e.: does the organizational culture lay down the guidelines for the acquisition and usage of IT, or is IT the one which, through its general use within a firm, defines the personality of a firm, and hence its culture? We shall discuss the two answers to this question.

*1. The organizational culture lays down the guidelines for the acquisition of IT and its later development into an IS.*

Several authors have supported this view, including Bradley, Hausman and Nolan (1993); Brown and Starkey (1994); Gordon and Gordon (1992); Laudon and Laudon (1991b); Moorman (1995); Poole and DeSanctis (1990); Stair (1992); Thompson and Wildavsky (1986) and Tolsby (1998).

The basis for this opinion is that, if the members of an organization share the view that IT, and its correct usage within an IS, entails competitive advantages for a firm and a personal or group satisfaction, which would be acknowledged, for instance, through a reward policy, then its acquisition and usage will be part of the firm's values, and also the opposite may happen.

*2. IT/IS is the one that establishes the specific character of an organizational culture.*

As in the previous case, there are many who believe in this relationship; we may quote Boland, Tenkasi and Te'eni (1994); Daily, Whatley, Ash and Steiner (1996); Hibbard (1998); Leifer (1988); Newman and Chaharbaghi (1998); Olson (1982); Robey and Azevedo (1994) and Stout (1980).

The justification for this view is that, due to the specific weight IT/IS is progressively gaining in all areas of business, and given its adaptability to all the departments of a corporation, IT/IS will influence the firm's personality to such an extent that they will create a shared, common vision which becomes a cultural value. However, we must agree with Weber and Pliskin (1996) that, although the connection between IS and IT and their compatibility with

culture exists in all the industrial and services sectors, their direct effect does not have the same strength. Thus, in the financial sector a great integration of the two components is required, whereas in manufacturing firms, where a lower IT/IS strength is required, a negative relationship with culture may be, in principle, less traumatic.

Once we have analyzed both views, we shall go back to our question: which is the correct one? It cannot be denied that both have their advantages and disadvantages but, in our opinion, they do not exclude each other. In other words, we believe that the culture has a direct influence upon IT/IS and vice versa. We are not proposing such an eclectic view as a way to solve a likely conflict between both theories, but because there really exists a two-way relationship between culture and IT/IS, to such an extent that a description of one of them would be an incomplete one if the other has not been considered. In this respect, Avison and Myers (1995) very explicitly believe that IT affects the organizational culture and vice versa.

In short, and going back to Figure 1, the success of an IS within a corporation will be conditioned by the confluence of the data, the IT and the people (the latter seen not only from a technical point of view, but also as individuals within an organizational culture). In this way, the information obtained from the IS for any kind of decision-making process will depend on all three components and a suitable relationship among them.

Concerning organizational culture, although we have established the mutual correspondence with IT/IS, we should consider the fact that there are many cultural typologies and, beyond such typologies, there is the specific culture for each firm. Therefore, each specific culture will influence and be influenced by the IS according to the concrete values shared within each organization. We shall analyze this issue in the following section.

### **Organizational culture and IS. A specific relationship**

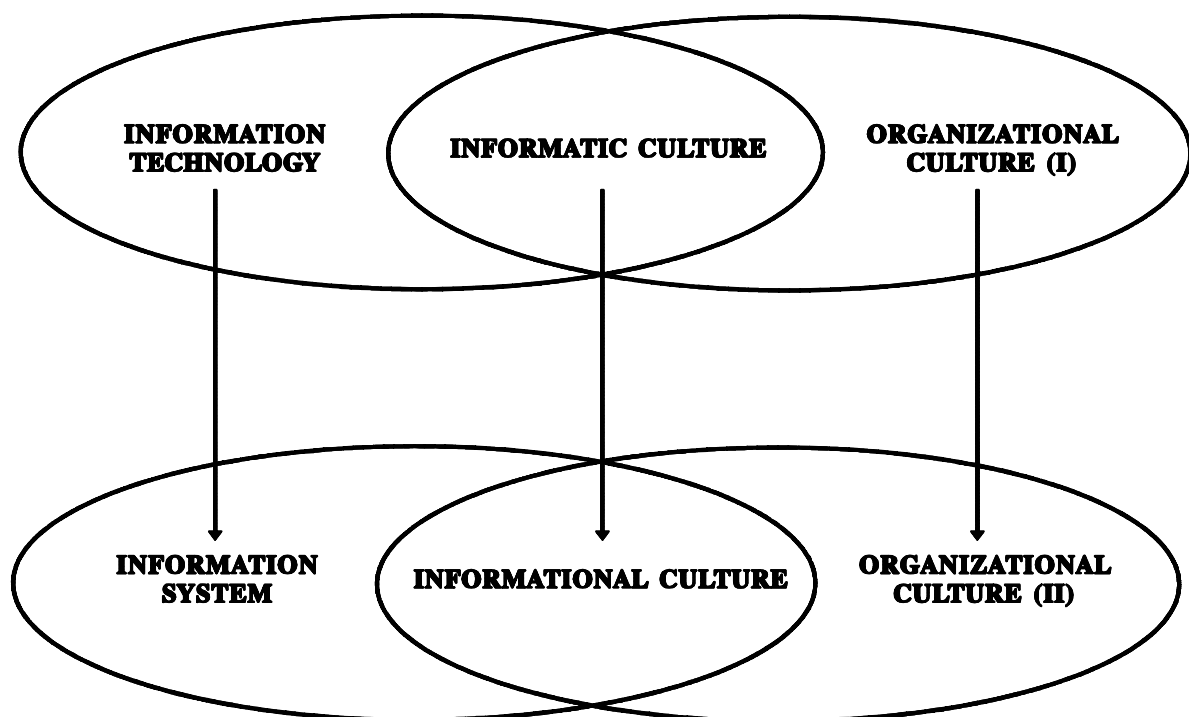
An organizational culture, as we argued above, consists in the values shared by the members of a firm; this is why there will be specific beliefs regarding any corporate structure and behaviour. When such beliefs are widely shared, the culture is said to be a strong or powerful one; however, when a certain value has been accepted by a very specific group just as the informatic department (for instance, the idea that an IS is a very important factor for a firm's competitiveness), then it is said that there is also a subculture. We have introduced this distinction in order to underline that we shall mainly describe the dominant culture of a firm, for the two options we shall discuss (informatic and informational culture) affect the whole organization and may result in two different views of IT/IS within the activity of a firm.

Once these differences have been established, we may identify two organizational positions in the face of IT. A first, less complex one, would entail accepting that using IT is important for a

firm (informatic culture); a second, more progressive one, envisages IT as the foundation for the creation of an IS enabling the firm to make correct decisions (informational culture).

The first one, an informatic culture, is easily identified by the members of a firm, for it is a material symbol of the culture; however, the informational culture is a much more complex one, for it includes the other one, but also the people -through the organizational behaviour-, the information and the data. There is no doubt that, when it is a shared value, an informational culture is more enriching for a firm's competitiveness, because it is not only a resource (IT) but also a capability (IS). All these ideas are summarized in Figure 2.

FIGURE 2. INFORMATIC AND INFORMATIONAL CULTURE.



As Figure 2 shows, an efficient transformation of IT into a suitable IS cannot take place without changing the informatic culture into an informational one. More specifically, it should be said that, more than changed, the set of values should be expanded, in such a way that an informational culture, in addition to informatic beliefs, should also have its own concept of support to IS in the process of supplying decision-making information.

A further important issue in Figure 2 is the analysis of how the informational vision will affect the global organizational culture (in Figure 2, it is the transformation of organizational culture (I) into (II). The answer is that all members of the firm must accept the usefulness of the informational culture. If these values generate a higher financial profit for a firm, they will be favourably received by CEO's. In this line, Byrd and Marshall (1996) stress the important role



played by culture within EIS (Executive Information Systems). At the same time, if they reduce anxiety and increase the satisfaction of users, IS technicians, and the whole organization, they will also be accepted.

Therefore, if these conditions are fulfilled, we could think that there will be a non traumatic modification (in the shape of an evolution) of the organizational culture through the informational values, towards a situation where the IS plays a more important role within corporate beliefs. Of course, the opposite process might also occur, and then the progressive incorporation of the IS into the firm's structure would be a much more complex one. This leads us to the idea that any managerial decision improving culture in this way will allow a positive acceptance during the implementation of IS/IT within a firm.

In order to understand this favourable relationship between informational culture and the implementation of IT/IS, we cannot forget the advice by Romm, Pliskin and Weber (1995), who warn us that any cultural modification decision must be a long term one, whereas the implementation of IT/IS may be made in the short term, which increases the difficulty in case of disagreement between them. Nevertheless, in the last section we shall suggest some guidelines to achieve an integration.

### **Characteristics of informatic and informational culture**

Once we have outlined the previous notions, we shall now study in depth the characteristics of an informatic and an informational culture, in order to decide which kind of managerial intervention is required to transform the former into the latter.

An informatic culture can only see the need to make tactical or short term decisions in the IT area; therefore, its values lie in separating such technologies both from the firm's strategic planning and from an IS generating strategic decisions. Other features of this culture are that the improvements created by IT are always measured in quantitative terms; the informatics department is seen as a cost center. As in this vision IT is a short-term concept, there is no investment plan in this area. This is why Mirvis, Sales and Hackett (1991) point out that firms may make mistakes when purchasing equipment, miscalculate the cost/profit benefit ratio or end up spending more and earning less than expected.

As a result of what we have described, the implementation of IT within the firm is only carried out by technical personnel, the users are disregarded and the senior management does not become involved in its development; everything is left to the informatics department and operations managers. This is clearly illustrated by the term "TI specialists culture", coined by Coombs, Knights and Willmott (1992).

Compared to an informatic culture, an informational culture goes much further, for it understands the usefulness of IS for strategic and tactical decisions (in the short, medium and

long term). Besides, within this corporate values IT/IS is measured quantitatively (financial cost/profit ratio), but also qualitatively (usefulness for all members of the firm); the informatics department is seen not only as a cost center, but also as a profit-creating one. Of course, since there is also a long-term view, the IS also requires an investment plan.

Finally, within these corporate beliefs it is assumed that the implementation of IS/IT requires the intervention of technicians and users in an organization; the management must also be involved by monitoring the process.

Although their terminology differs from ours, Bensaou and Earl (1998) also have analyzed this idea, which they relate to the Western and Japanese way TI are managed. As they have pointed out, the question of how an effective IS must be designed for a corporation, leads to two positions: Western firms design the system as elegantly as possible from a technical point of view, and then try to persuade all the organizational members to adapt to it (which would, in our opinion, be an example of informatic culture); on the contrary, the Japanese design the system in order to profit from the explicit and implicit knowledge that individuals already possess (which we would describe as an informational culture). Despite the usefulness of this analysis, we believe that it is excessively simplifying to establish country stereotypes, for in these qualitative issues each organization has its own situation (we cannot forget that a firm's culture is like an individual's personality). In other words, the idea is theoretically interesting, but it is difficult to draw generalizations from it.

As a consequence of all this, we can see that we are not dealing with two opposed cultures; rather, the informational culture represents a more advanced position than the informatic culture, in fact the first includes the second and goes beyond it, in order to better profit from IT through a useful IS which is valued and accepted by an organization; in this IS, training plays a crucial role, not only concerning technicians, but also users.

At the same time, it should be pointed out that between an informatic culture in its most strict meaning and an informational culture, with its clearly defined characteristics, there is a wide range of possibilities which may apply to any firm and it is necessary to know. In some cases, there may not exist even a minimum informatic culture, for it is believed that IT resources are not useful to a firm; although this is exceptional in the marketplace, the possibility cannot be ruled out. In this way, a diagnosis of the values accepted by all the organizational members as regards IS/IT will reflect the position of the firm in this issue, and also how intense the effort must be until a fully profitable informational culture can be reached.

### **Implementing IS and cultural requirements**

From what has been said so far, it follows that an informational culture is the one allowing a better usage and succesful implementation of an IS. However, not all organizations share these

beliefs; therefore, in this section we shall discuss the guidelines for an IS to be most efficient in a firm through technical usage, but especially through a clear motivation among the people related to them. This is a complex issue, which requires, to start with, the study of the factors of resistance to their implementation; then, we shall try to find ways to overcome these obstacles.

Thus, we may list the main reasons to oppose IS/IT by making a distinction between management and non management staff.

#### *A. Non management staff*

1. It may involve routine processes, with the negative effects they entail (Walton 1989).
2. An inadequate usage is likely to create communication barriers, because they isolate tactical users.
3. In general, they may generate negative psychological processes, such as lack of commitment, motivation and satisfaction amongst the organization, as the firms become less dependent on these individuals and more dependent on the IS (Ives and Olson 1984; Markus and Robey 1983; Taggart and Robey 1981).

#### *B. Management staff*

1. It may create opposition as managers have to use a keyboard, which they consider a secretarial job.
2. Managers may not see the IS as something useful, for the information it offers does not appeal to them.
3. A non user-friendly IS may cause managers be afraid of making a fool of themselves by being unable to learn.
4. Refusal will arise if it is felt that the IS may lead to an undesirable redistribution of power.

As a whole, whatever the level within the organizational hierarchy, the implementation of an IS may create "techno-stress" (Brod 1988), as a situation resulting from all these negative feelings.

A way to eliminate, or at least reduce, these obstacles, is by analyzing the culture and adapting it to the implementation of the IS. In this sense, Lu (1995) has pointed out that, if the existing culture emphasizes innovation and decision making in risk environments, the introduction of IS/IT will meet a lower opposition by all the organization. Unfortunately, firms sharing these values are exceptional, and therefore in most cases there will be some refusal, which makes it necessary to envisage procedures to overcome it; this may be done by means of cultural change programmes.

If this option is chosen, we should not disregard (Cooper 1994) the ethical issues involved in the process, such as the likely effects of the cultural change and who should take part in the change programmes (both those in charge of organizing the change and those who must undergo such programmes).

In addition to the ethical problems, there is an additional one if the cultural values are against the implementation of an IS: as we have said, a cultural change needs a long time for the new shared beliefs to be modified, but very often the IS must be implemented in the short term.

Therefore, the sequential processes including IS implementation and cultural change must be carefully analyzed, given the temporal lack of adjustment that may occur. Thus, if the organization carries out an "IS scheme", it must start by drawing a list of projects to be developed over a few years, and then prioritize them; in this way, if this planning exists, it must be a long-term process, like the culture itself.

To sum up, the culture may not be ignored when implementing an IS (Sankar 1988), it must be carefully audited (Kovacevic and Majluf 1993) and must be in an ideal situation before the IS is implemented in a firm (Atre 1995). Therefore, there are plenty of conditions that must be met, which we shall try to overcome through the patterns explained in Figure 3.

FIGURE 3. IS IMPLEMENTATION/CULTURAL CONSISTENCY.

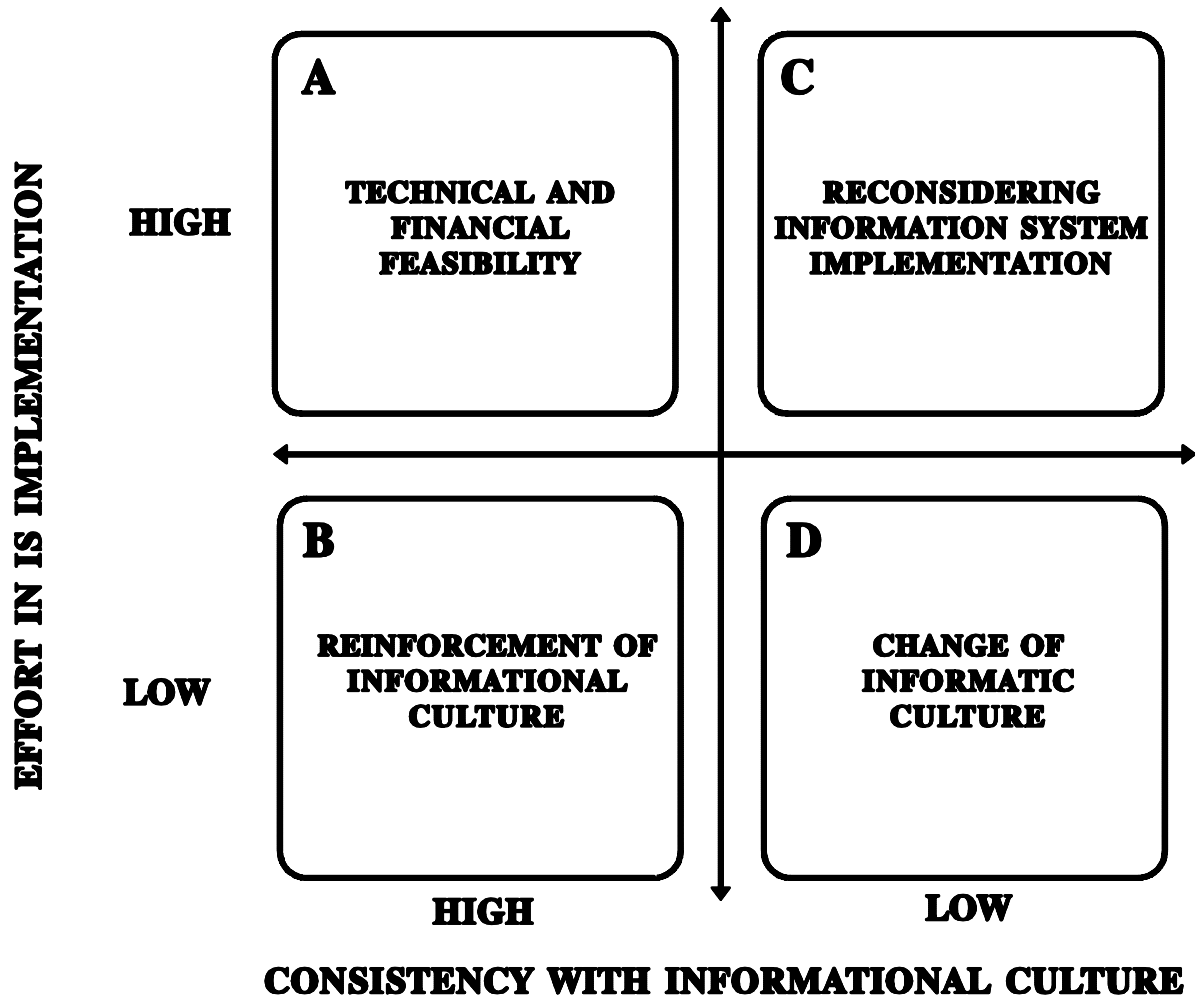


Figure 3 summarizes the four situations that may arise when implementing an IS, concerning the specific cultural situation existing in a firm. In this way, in the vertical axis we have represented the effort in IS implementation; this refers to the degree of technical and financial feasibility of an IS based on the quantitative, measurable effort an organization must make in order to implement it. More specifically, this includes the need for technical personnel training so that they can benefit from the IS, the cost-benefit ratio of IS introduction (measurable in quantitative and financial terms) and the tactical/strategic support an IS may yield.

The horizontal axis shows the consistency with the informational culture. Of course, before the new IT is introduced to develop the IS, it will be necessary to audit the specific culture of the organization, with special reference to the common attitude of its members towards IS/IT. A few guidelines on how this study can be carried out can be found in Burack (1988); Kilmann (1988); Louis (1985); Scholz (1987) and Trice and Beyer (1993).

If the situation is like the one in cell A, where there is a suitable informational culture, but a great quantitative effort must be made to implement the IS, the decision is easily made. It is necessary to assess the technical and financial feasibility as we discussed above; if it is a positive one, the IS will be easily and successfully introduced; otherwise, the investment must be reconsidered. The issue of financial feasibility and cultural consistency is also analyzed by Agarwall and Prasad (1998) and Saunders (1998).

If the situation is that in cell B, then the position is an ideal one, for the firm will profit from implementing the IS and at the same time strengthen the informational culture. At this stage we may quote Kydd and Jones (1989), who very explicitly consider that, for a firm to obtain positive returns from its shared IT investment, the organizational culture must be in line with it.

When the organizational situation is that in cell C, there is a total lack of agreement between the two factors at stake. Here, the firms should reconsider whether it is really interested in starting this process, for there are great disagreements. In this sense, individuals will refuse IS/IT, and besides the quantitative advantages of its implementation will be highly doubtful.

Finally, in a position such as D, the problem arises from the confrontation with culture. However, as it is technically and financially feasible, the possibility of IS implementation must be taken into account. Considering that the culture will have been previously audited, it will be known to which extent there is an actual refusal towards IS/IT. If the existing one is an informatic culture, a procedure must be envisaged to transform it into an informational one. Also, a situation might arise in which not even informatic values exist; in this case first it would be necessary to persuade everyone in the organization to share them, so that they can later be transformed into informational values.

At this stage, it may not be forgotten that cultural modifications are long term ones, but it is possible to acquire IT and try to implement an IS in the short term; therefore, the issue of culture must be carefully considered (regardless of whether an IS is implemented or not) and, depending on the specific situation, long-term IS planning must be made so that there is an agreement between them and the culture. Given the previous requirements, we shall suggest some outlines to obtain this transformation.

Firstly, if it does not exist in the firm, the figure of Chief Information Officer (CIO) must be created; this person would be ultimately responsible for these matters and would be on the same level as any functional chief officer in the firm. This would show everyone the importance attached to IS/IT.

Another requirement is a continuous market analysis showing the possibilities concerning IS/IT. It is not a question of purchasing every new item appearing on the market, but of being aware of it, and informing those potentially interested in the firm about it (something which the CIO could do too). This will facilitate the creation of a pre-cultural knowledge within the firm.

Then, we consider that the best choice is a «bubble-like» cultural implementation, consisting in gradually introducing IT/IS. First, a small user group must be found, whose members are the most enthusiastic about IT/IS, benefit the most from them and may afterwards propose the application, its advantages and, in short, the informational culture to the rest of the organization, training and supporting new users while the desired culture becomes firmly rooted.

## **Final conclusions**

In this paper we have tried to prove that investing money in IT/IS is not enough for them to generate positive results for a firm. There is a special component within any IS, the human one (considered in itself and as interacting with others) which is a must for the success of such IS. This does not merely entail the technical usage of this equipment, but most specifically the qualitative one, understood as organizational behaviour.

Within this vision, the notions of informatic and informational culture appear as the main categories that may account for the values shared by corporate members concerning IT/IS. An analysis of the characteristics of the two possibilities shows that an informational culture is the one that allows firms to best profit from IT/IS. Unfortunately, not all firms are in that situation, and besides IT/IS do not entail the same cost/benefit ratio for all of them. Hence, it is unavoidable to discuss cultural changes and IS profitability.

Both individual and group resistance to IS implementation are very likely to occur, which cannot be said about the acceptance of cultural change. However, we have suggested some general guidelines to achieve it. It may be insufficient, but it cannot be doubted that, without auditing and trying to forecast the cultural consequences of the organizational behaviour linked to IS implementation, such implementation is very likely to fail, no matter how much money is invested in these systems. The ideas have been put forward, and the road is open; further research will be needed to cast more light upon the way action may be taken upon both the organizational culture and the IS, so that they may be a source of competitive advantage and everything this entails.

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